

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)**ScienceDirect**

Procedia - Social and Behavioral Sciences 186 (2015) 209 – 215

**Procedia**  
Social and Behavioral Sciences

5th World Conference on Learning, Teaching and Educational Leadership, WCLTA 2014

## Comparing Reported Classroom Practice in Public and Private Schools in the United Arab Emirates

Martina Dickson<sup>a\*</sup>, Hanadi Kadbey<sup>a</sup>, Melissa McMinn<sup>a</sup><sup>a</sup>*Emirates College for Advanced Education, Abu Dhabi, United Arab Emirates*

---

### Abstract

This is a comparative study of science classroom practice in public and private schools in Abu Dhabi, the capital of the United Arab Emirates. The vast majority of science teachers in these schools are expatriates, specifically recruited from overseas to teach through the language medium of English. Since both groups of teachers come from a diversity of international backgrounds (though predominantly from 'Western' countries) it might be fair to hypothesize that the range of classroom practices of private and public teachers would be broadly similar, accounting for differences in individual school systems such as resources, class sizes, training opportunities etc. We surveyed 248 public school teachers and 66 private school teachers, and asked them to rate statements about their science classroom practices, such as whether they encouraged students to work collaboratively, employed inquiry based learning strategies, adopted hands-on student centred approaches to learning in science, applied science to real life and drew connections between science and other subjects. Contrary to our hypothesis, it was found that there were extremely significant differences between the responses of the private and public school teachers. We make some suggestions for why there might be such a chasm in reported practices of public and private school teachers.

© 2015 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Academic World Education and Research Center

**Keywords:** United Arab Emirates, Science Teaching, Public Schools, Private Schools

---

### 1. Background: Public and Private Schools in the U.A.E.

Abu Dhabi is the largest of the seven emirates which make up the United Arab Emirates, (U.A.E.) established in 1971. Until that time, schooling was not obligatory for students and indeed only generally available for an elite male sector of society. Post-unification, however, the education system underwent rapid development. Almost overnight, primary enrolment reached relatively extremely high figures, schools were set up, and curricula and expertise such

---

\* Martina Dickson. Tel.: +4-345-443-533.

E-mail address: [martina\\_dickson@hotmail.com](mailto:martina_dickson@hotmail.com)

as resources and teachers imported from other Arab countries such as Egypt and Kuwait. Whilst quite amazing progress was made over a few decades, by the early 2000s, leaders were calling for a further overhaul of a system which critics considered to have become staid by then (Macpherson, Kachelhoffer & El Nemr, 2007). A turbulent period of reforms began and teachers who were already in the system received in-service training in attempts to radicalize the instructivist teaching styles which were dominant at that time.

Since 2006, public schools in Abu Dhabi have been going through enormous changes as a result educational reforms. As part of a long term strategic and operational plan to dramatically alter the education system, public primary schools were staffed by expatriate teachers known as English medium teachers (EMTs). These teachers were to teach science, maths and English and were trained in English medium universities and recruited from outside the UAE. The concept behind this recruitment policy was that in theory, these teachers being educated, trained and having worked in supposedly developed countries with long established education systems, would bring with them this 'best practice' and implement this in the schools of Abu Dhabi. Private schools in Abu Dhabi have a long history of diversity, but also a long history of recruiting teachers from the same kind of backgrounds as public schools, for the same reasons. So, science in both public schools and private schools is taught predominantly by expatriates, from generally the same countries (depending sometimes on the private school curriculum) and almost without exception having been trained and having some years of experience in their native country's education systems.

The U.A.E. had 483 private schools and 702 public schools in 2012 (UAE National Statistics Bureau, 2012 a), a figure which has reportedly been increasing even since then as the ratio of expatriates to nationals continues to increase. The percentages of nationals in the UAE stood at 11% at the 2010 census (UAE National Statistics Bureau, 2012 b). The emirate of Abu Dhabi had 183 private schools in 2013, and is under increasing pressure to create even more schools for the increasing population (Ahmed, 2013). Private schools in Abu Dhabi are huge in variety, following anything from British, American, Canadian to Indian and Pakistani Community Schools, but all have to follow aspects of ADEC guidelines are subject to frequent evaluation by ADEC. Public schools are obviously much more heavily monitored and strictly adhere to the New School Model, ADEC's curriculum which is an adaptation of the Australian New South Wales curriculum implemented at the early stages of the reforms in 2006.

## 2. 'Best' Science Classroom Practice

What constitutes 'best' practice in the science classroom, exactly? ADEC's New School Model Teacher Guide emphasises inquiry based learning, understood as being experience-centred, with sensory experience playing a large role in the inquiry (Ireland, Watters, Brownlee and Lupton, 2012). ADEC defines inquiry based learning in the classroom broadly as when students are "working together, constructing meaning through collaboration with others, engaging in critical thinking and problem solving" (ADEC New School Model Teacher Guide, 2013, p. 21). Best practice, it is generally understood by science educators, allows students to become more self-directed and increasingly independent and autonomous thinkers. Hackling and Prain (2005), characterize effective science teaching and learn as where "students are engaged with inquiry, ideas and evidence, [and] classroom science is linked with the broader community and students are challenged to develop and extend meaningful conceptual understandings" (p.19). ADEC, too, has well-articulated this in its New School Model Documentation, e.g. "children are encouraged to explore their learning actively through creativity and problem solving, [and are] engaged in purposeful practice as they move towards independence" (ADEC New School Model Teacher Guide, 2013, p. 8).

Buyuktaskapu (2010) characterized effective teachers as those whose approach resulted in the production of individuals who could inquire, research and question. A passion for science, as a precursor to the necessary development of the skills for effective teaching, is critical (Vasquez, 2008). Staver (2007) defines effective science education in part as "using guided inquiry teaching strategies that lead learners to continue developing and modifying their knowledge" (p.12) and postulates that effective learning in science provides students with opportunities to claim ownership of their learning. This is very much in keeping with the ideology behind ADEC's New School Model, with teachers expected to develop students as problem-solvers, who are curious and investigative. Other authors have noted too, the importance of emphasising the real life relevancy of science by integration with other subjects such as maths and language (Clark, 2002).

### 3. Research Questions

The main research questions which this study was designed to address were:

- How closely aligned with 'best practice' in science education were the reported practices of private and public elementary school teachers in Abu Dhabi?
- What statistical correlation exists, if any, between these groups of teachers?

### 4. Methodology

The study utilized a mixed methods design. A survey questionnaire was developed, based heavily upon the framework which the literature review provided regarding what constitutes best practice in science education. A summated rating (Likert) scale was created in order to rate their agreement or disagreement to these practice statements, with a number being assigned to the choices for statistical analysis (Robson, 2011). In addition to these rated statements, participants were asked to add additional responses if they wished, providing some qualitative data too. The survey was in English, but this was considered to be valid as by definition, EMTs teach science and must have English either as a mother tongue, or if not then a score of at least a 6.5 in the IELTS (International English Language Testing System). There were fourteen statements, and respondents offered a space to elaborate on any aspects of their classroom practice.

The surveys were sent out to a number of private and public schools, after seeking and obtaining ethical approval from the Abu Dhabi Educational Council to do so. School principals were requested to forward the surveys to their science teachers. We therefore have no way of knowing exactly how many schools took part in the study, but since we asked some demographic information at the beginning of the survey, we knew that 248 teachers from public schools, and 66 teachers from private schools, responded to the survey. The much lower response rate from private school teachers was of course disappointing, and no doubt affects the accuracy of our reported findings. This may be attributable in part to the fact that our teacher training college has very close relationships with public schools in particular, due to our students working there on internship, and so perhaps this familiarity played a part in the high response rate in public schools. Nonetheless, our aim was to explore trends and patterns in practice rather than absolute findings which this data allows us to do.

The survey was first trialed on two teachers who had previously worked in public schools, and adjustments to the questions made on the basis of their feedback, thus increasing validity of the tool. The survey was completed online using surveymonkey™ and statistical analysis performed using Excel Statistics package.

### 5. Results

#### 5.1 Quantitative Data

Table 1 shows results of the teachers' agreement rating of statements of science classroom practice. It can be clearly observed that for all statements with the exception of one ('I use ICT tools in my science class') the mean scores for the teachers in private schools are higher than those of the public schools. The practice statements have been carefully selected to align with best accepted international practice (and that of ADEC), and all take a positive stance in this vein for ease of interpretation. Therefore, it can be assumed that the higher mean scores of the private school teachers are indicative of a closer alignment with the ideal 'best practice' in science. In order to explore this further and to check that there was an actual statistical significance between the groups' responses, we applied the unpaired two group (two tailed) t-test. In conventional statistical significance, the resulting probability value (p) must be less than 0.05 (Robson, 2011). Table 1 shows that in fact, all of the response statements generated a p value less than 0.05, with some substantially lower than this value. In other words, the difference in reported science classroom practice between private and public school teachers is highly significant. In order to probe why this may be the case, we now look to the additional qualitative responses which were added to the survey.

Table 1 Comparison of Reported Science Classroom Practices in Private and Public Schools

Statement of Reported Science Classroom Practice	Private Schools Mean Scores (n=66)	Public Schools Mean Scores (n=248)	Student's t-test comparing responses ( $p < 0.05$ significant)
1. I allow my students to explore and discover science concepts on their own with minimal teacher input.	2.55	2.00	$4.16 \times 10^{-8}$
2. I involve students in class debates and discussions.	3.35	2.50	$1.81 \times 10^{-10}$
3. I actively involve students in hands-on activities and investigations.	3.06	2.73	0.001
4. I provide opportunities for students to work in pairs or very small groups	3.53	3.02	$2.2 \times 10^{-6}$
5. I incorporate scientific inquiry skills in my science classes.	3.20	2.66	$8.7 \times 10^{-7}$
6. I encourage collaborative learning among my students	3.44	3.08	0.0005
7. I use ICT tools in my science class.	2.62	2.74	0.38
8. I arrange library lessons and field trips connected to the science topics	2.22	1.54	$1.71 \times 10^{-10}$
9. I relate science concepts studied in class to our daily life and to the real world.	3.31	3.08	0.029
10. I create differentiated resources to support student learning in science	3.00	2.40	$3.42 \times 10^{-7}$
11. I create differentiated activities and experiments to support student learning in science	2.88	2.34	$5.03 \times 10^{-6}$
12. I use different science assessment tools, not only projects and exams.	2.92	2.61	0.0077
14. I help my students to make connections between Science, Maths and English.	3.30	3.02	0.0073

## 5.2 Qualitative Responses

### 5.2.1 Public School Teachers' Additional Responses

The public school teachers rated the practice statements less positively than their private school counterparts. Whilst we did not ask nationality data (other than Emirati/ non-Emirati), we know that all of the teachers in the study were expatriates and from a broad and diverse range of nationalities. Whilst it is true that teachers of science in public schools are predominantly 'Western', we hypothesized that by their recruitment it would be fair to assume that most teachers had been trained in 'best practice' in their home countries, wherever that may be.

Some teachers were very articulate about the fact that their classroom practices differed from what they knew to be 'ideal' but that they were unable to fulfil these ideals due to constraints and difficulties faced in their school environment. One reason cited very often for this was due to a lack of resources and materials to carry out their science activities, e.g. "Teachers are not given science kits for classroom use, which results in teachers having to spend their own money on experiments". Another teacher said "I often have to pay for equipment from my own pocket or rely on students to bring consumable materials into school. Resource management is a challenge that can

often affect how often I can tackle practical science.” Statements 3,5,10, 11 (Table 1) relate to student-centred activities and practical work such as inquiry based learning; the lower means could be explained by these types of responses. Statements 8 and 9 ask about relating science to real-life and organizing field trips; the qualitative responses explain the very low mean of response to this statement (1.54). The teachers said, for example, that “we are not allowed to plan our own field trips. I would like for us to have a chance to go on field trips that pertain to our students and their needs” and “at my school, we are not allowed to arrange our own field trips, only to suggest. We get only one a year. All my science related suggestions were turned down.” These statements suggest a lack of the teachers’ sense of empowerment, or trust from administration, or both.

Some felt that management of students’ behavior was so much of a challenge that practical or exploratory work was an impossibility: “Allowing Grade One Boys to explore would create complete chaos in the class. Their concentration and good behaviour is limited before they become disruptive.” Statements 11 and 12 relate to differentiated learning of both resources and activities, but again, these statements had fairly low mean responses, perhaps because, as one teacher explained: “differentiation in science often ends up differentiating by English ability as science concepts are all new and difficult and the girls find it very difficult to explain what they may or may not understand.” Some teachers thought that they would like to be able to integrate science more with maths and English, and were aware that they should be doing this, but that they lacked the empowerment to be flexible within the ADEC curriculum to be able to do such things, e.g.: “Integration between Math Science and English works best but that means that the Science curriculum cannot be followed exactly. Teachers must have the flexibility to design the lessons as needed with importance where it is needed based on the needs of the students/class.” Statements such as these, explain why the mean score to No. 14, is not higher. ADEC introduced a thematic approach to teaching science, mathematics and English in public schools in its updated curriculum version in 2013, but its implementation in reality may be questionable and highly variable (Dickson and O’Malley, 2014).

Overwhelmingly, although we did not specifically ask a question about language, teachers’ qualitative comments regarding the students’ levels of English language as being a barrier to doing much of the practice embodied by these statements. It is easy to see how, therefore, statements such as ‘I involve students in class debates and discussions’ had low mean scores (2.50) given the emphasis on language which this practice involves, and perhaps too may explain the mean score of 2 for statement 1 (‘I allow my students to explore and discover science concepts on their own with minimal teacher input’) although we will refer to this idea again in the subsequent section for an alternate explanation. One teacher wrote succinctly that “language barrier has an influence on discipline, which, in turn, influences practical work opportunities”, while another thought that “students do not have the language to discuss in English yet – language and vocabulary is the BIGGEST issue!”

### *5.2.2 Private School Teachers’ Additional Responses*

Interestingly, although the mean scores for the private school teachers’ responses were higher in every case, and highly statistically significant for most of the t-test results, the qualitative comments for both public and private teachers had some similarities. Feeling frustrated about a lack of practical science resources being available to them was a common theme, e.g. “we need more scientific resources for every student to be able to work using his /her own hands and not wait for others” and “manipulative resources are very important”. Another commented that having “proper materials for experiments without being incredibly difficult to retrieve” was desirable and that there was a need for “the space and equipment to do practical science activities”. There did however seem to be a great emphasis on demands for teaching resources from the private school teachers, which was less apparent from the public school teachers’ comments. For example, one private school teacher said that “allowing quality science material into the country/school from abroad (or EQUAL domestic alternative) would be a start”, suggesting that no such equivalent currently existed in their school. There were also suggestions by private school teachers that greater professional development opportunities needed to be made available; “the opportunity for teachers to attend CPD courses relating to the teaching of Science and the implementation of the new Science curriculum”, “[we need] training in the standards... frequent professional development to all teachers”. One teacher was specific that the training should be focused on science, particularly for those teachers who were not strong in science themselves. There is such a wide diversity of facilities in private schools that it is difficult to generalize, but for sure, the fact that

the schools are private clearly does not indicate that resources are plentiful.

## 6. Discussion of Results

Obviously, our discussion must be borne in the light of the limitations which the small numbers of private school science teachers, compared to those of the public school teachers. However, some very clear trends emerge from both the quantitative and qualitative data analysis. Both groups clearly struggle with a perception (or perhaps a reality) of a lack of experimental resources, and lab support in order to carry out the practical work they would like to. The public school teachers complain only of this type of resource, though, and not (in this study, at least) so much of other resources such as written material like textbooks and workbooks. One suggestion for this may be that ADEC schools are supplied with uniform texts each year; teacher guides, student textbooks and student workbooks in science, and whilst some teachers see the language of these resources as being unrealistic and inappropriate, perhaps their widespread availability is the reason for no mention of resources such as these in this study. By contrast, the huge variation among private schools and the variety of national curricula followed means that this consistency may not exist. This is a finding which may contradict that of McKinnon, Barza and Moussa-Inaty (2013) who interviewed school principals in their quest to compare science teaching between public and private schools in Abu Dhabi, and noted that “although public schools are well resourced with lab spaces, private schools are better resourced with other types of science materials”. Vasquez (2008, p. 71) agrees:

Whichever way the materials are delivered or supplied to the teacher, the main point is that to be an effective teacher of science you have to have the materials to do the hands on investigations ... most of the time the teachers who rise to the top are those who have a strong support system.

It is very interesting to note that all of the requests for more professional development came from the private school teachers, and none at all from the public schools. Again, this could be because of ADEC’s policy of staffing all elementary schools with a Head of Faculty, part of whose remit it is to provide professional development a number of times each week. Referring again to the McKinnon et al (2013) study, the public school principals whom they interviewed were found to be “concerned with improving the teaching skills and strategies of their educators which will influence their teaching in all subjects” (p. 60) but thought that private schools were better suited to offering professional development specifically within the science discipline, a finding contradicted by the private school teachers’ comments in our study. Interestingly, they stated that “public school principals acknowledge that a lack of time is a major barrier to initiating traditional PD programs .. [and] that teachers were unwilling to attend training after school hours, presumably because of family obligations as consistent with the local culture” (p.58). This does not appear to be so for the teachers in this study, but then again, none of these are Emirati (as very, very few English Medium Teachers in public schools are) so therefore local cultural discussions are not relevant to the question of PD attendance here. Only the private school teachers mentioned needing to upskill their own science knowledge; it is unclear why that would be.

Both public and private school teachers mentioned lack of time as a constraint, a universal cry from science (and indeed most types of teachers) teachers everywhere. Completely absent from the private school teachers’ comments were statements relating to classroom management challenges (which the public school teachers report as hampering them from carrying out the best practice possible), as well as the English language issues which were so prevalent for the public school teachers. These two, fundamental pedagogical constraints could well begin to explain the chasm between the groups of responses. Why public schools would report so many more issues with behavior management, which could explain their lower means of student-centred practices, is unclear. Classroom management has been shown by some to improve, or at least become less of a concern, for teachers with greater number of years of experience (Klassen and Chiu, 2010). Yet our data does not support this theory; in this sample, 51% of the public school teachers had more than ten years’ teaching experience, compared with a very similar 49% of the private school teachers in this study. There are some theories supporting the idea that behavior (of boys, particularly) is improved by co-educational institutions; the vast majority of private schools in Abu Dhabi are co-ed, the vast majority of public schools in Abu Dhabi are gender segregated. Perhaps too, we cannot isolate the fact that the teachers are from a different country, culture and speak a different language to their students in public schools which may not be true in the private sector; this may also have an effect on classroom management. McKinnon et al



(2013) found that both public and private school principals named teaching science content in English as a major challenge. However, no private school teachers in our study made any reference to teaching in English being a particular problem, nor that their students struggled with English language proficiency in a way which hindered their teaching of science.

## 7. Conclusion

This study shows that there are highly statistically significant differences in reported practices of science teachers in private and public primary schools, with private school teachers reporting practices such as collaborative, student centred and inquiry based learning, in a greater alignment with accepted 'best practice'. Teachers from both sectors complained of a lack of resources to be able to carry out practical science experiments, whilst only private school teachers extended this to all kinds of teaching materials. Statements regarding facing challenges from behaviour management and students' low English language levels came almost exclusively from the public schools teachers, which may explain the wide gap in the quantitative data from the two sectors. These findings may help both sectors to meet the needs of their teachers in order to optimise science teaching.

## References

- ADEC New School Model Teacher Guide. (2013). Abu Dhabi Educational Council, Abu Dhabi.
- Ahmed, A. (2013). Abu Dhabi needs 100 new schools in 7 years as emirate braces for influx. *The National*, January 8<sup>th</sup>. Retrieved from: <http://www.thenational.ae/news/uae-news/education/abu-dhabi-needs-100-new-schools-in-7-years-as-emirate-braces-for-influx#ixzz3Dr9yxwOb>
- Buyuktasapu, S. (2010). Examination of Pre-school Teachers' Beliefs about Science Education. *The International Journal of Research in Teacher Education*, 1, 14-25.
- Clark, T.C. (2002). *Designing & Implementing an Integrated Curriculum: a Student-Centred Approach*. 4<sup>th</sup> Edition, Holistic Education Press.
- Dickson, M. & O'Malley, V. (2014). Pre-service Emirati Primary School Teachers' Experiences of Thematic Teaching. *Journal of Teaching and Teacher Education* 2(2)
- Hackling, M.W. & Prain, V. (2005). *Primary connections – Stage 2 Trial: Research Report*. Australian Academy of Science. Ireland, J.E., Watters, J.J., Brownlee, J. & Lupton, M. (2012). Elementary Teachers' Conceptions of Inquiry Teaching: Messages for Teacher Development. *Journal of Science Teacher Education*, 23, 159-175.
- Klassen, R.M. & Chiu, M.M. (2010). *Effects on Teachers' Self-Efficacy and Job Satisfaction: Teacher Gender, Years of Experience and Job Stress*. *Journal of Educational Psychology*, 102(3), 741-756.
- Macpherson, R., Kachelhoffer, P., & El Nemr, M. (2007). The radical modernisation of school and education system leadership in the United Arab Emirates: Towards an indigenised and educative leadership. *International Studies in Educational Administration*, 35(1), 60-77.
- McKinnon, M., Barza, L. & Moussa-Inaty, J. (2013). Public versus private education in primary science: The case of Abu Dhabi schools. *International Journal of Educational Research*, 62, 51-61.
- Robson, C. (2011). *Real World Research: A resource for users of social research methods in applied settings*. Third Edition. Wiley.
- Staver, J.R. (2007). *Teaching Science*. Educational Practice Series 17, International Academy of Education, Australia.
- UAE National Bureau of Statistics. (2012 a). Education Statistics Database. Retrieved from: <http://www.uaestatistics.gov.ae/EnglishHome/ReportDetailsEnglish/tabid/121/Default.aspx?ItemId=2226&PTID=104&MenuId=1>
- UAE National Bureau of Statistics. (2012 b). National Population Data Statistics. Retrieved from: <http://www.uaestatistics.gov.ae/ReportPDF/Population%20Estimates%202006%20-%202010.pdf>
- Vasquez, J.A. (2008). *Designing and delivering effective science instruction*. Portsmouth: Heinemann.